

**CEO2019 'Camera-Ready' Paper TEXT Submission Template**

<b>Title* (Maximum length: 80 characters including spaces)</b>
Ensuring successful knowledge transfer in building renovation projects
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<b>Acknowledgements</b>
<p>This paper is connected to an EU-project called "Rezbuild" (<a href="https://rezbuildproject.eu/">https://rezbuildproject.eu/</a>), which focuses on developing decision and planning support for accomplishing near zero-emission in refurbishment of dwellings. We would like to thank our reviewers for their constructive comments.</p> <p>This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 768623. Any dissemination of results must indicate that it reflects only the author's view and that the Commission is not responsible for any use that may be made of the information it contains.</p>
<b>Word Count * (This is the total number of words from the beginning of the abstract to the end of the reference list in this text document.)</b>
2899
<b>Structured Abstract* (please fill out each section below)</b>
<p><b>Purpose:</b>  This paper aims to address one of the fundamental issues of gathering existing knowledge/solutions from projects for re-use in other projects; that is, contextual elements that are integrated with the knowledge. Contextual elements that are associated/integrated with knowledge do not often taken into consideration adequately during knowledge transfer. Hence, this can lead to undesirable consequences; for example, unnecessary use of time and resources. This paper will increase the awareness of (and lead to finding appropriate ways to) dealing adequately with contextual elements in knowledge transferring processes.</p> <p><b>Design/Methodology/Approach:</b>  Qualitative method: Narrative literature study</p> <p><b>Findings:</b>  This paper provides a conceptual understanding of dealing with contextual elements in knowledge transferring processes from the sense making perspective.</p> <p><b>Research limitations/implications:</b>  This paper, which is connected to a research and development (R&amp;D) project that has recently started, uses this paper to emphasize the importance of addressing contextual elements adequately in knowledge transferring processes. This emphasis is important since this R&amp;D project deals with, among other things, collecting lessons learned on energy efficient solutions from building and renovation projects for re-use in other renovation projects.</p> <p><b>Practical implications:</b>  This paper will contribute to replicate knowledge / lessons learned effectively and to increase the application of energy efficient solutions in building renovation projects.</p> <p><b>Originality/value:</b>  This paper attempts to point out and increase our understanding on how acquisition of knowledge at an earlier point of time can influence transferring of that knowledge at a later point of time. In general, there is inadequate focus and awareness on this issue in construction projects.</p>
<b>Keywords (Min 6)*</b>
Knowledge transfer, Building renovation, Project, Sense making, Context, Lessons learned, Knowledge acquisition
<b>Conference Paper*</b>

## 1. Introduction

This paper looks at one of the major underlying aspects that has to be taken into consideration, when it comes to knowledge transfer. The aspect is, dealing with contextual elements that are integrated with the knowledge that is to be transferred.

This is a conceptual paper. The structure of this paper is as follows: Following the introduction, we will present a description / definition of knowledge that provides a brief explanation for emphasizing the importance of contextual elements in knowledge transferring processes. Then, we will describe our research method. Followed by research method, we will present our discussion on contextual elements in connection with knowledge transfer. Finally, concluding remarks will wind up the whole discussion.

## 2. Knowledge transfer in project settings

In this paper we use a categorization presented by Spender (2008), dividing knowledge in three major categories:

- Knowledge-as-data: The category tends to suggest that knowledge is considered as an object, and to point out the explicit and objective characteristics of knowledge
- Knowledge-as-meaning: This category deals with reflection and sense-making
- Knowledge-as-practice: This category views knowledge beyond the cognitive spectrum – beyond the sense-making aspect. It incorporates tacit characteristics of knowledge

Though the positive effects of knowledge transfer are recognized, it is still challenging to implement inter-project knowledge transfer and harvest the desired benefits from it (Swan & Scarbrough, 2010). There is increasing focus on leveraging learning and reusing knowledge across projects (Duffield & Whitty, 2015; McClory et al., 2017).

There are various aspects that are to be considered when lessons learned and best practices are to be transferred. In this regard, we will look at how contextual elements affect the knowledge transferring process. Contextual elements are primarily connected to the categories "knowledge-as-meaning" and "knowledge-as-practice". Generally speaking, the tacit dimension of knowledge, which represents a huge portion of knowledge (Polanyi, 1966; Nonaka & Takeuchi, 1995), also includes contextual elements of knowledge. (Though this paper does not directly deal with tacit knowledge, we would like to point out the relevance here.) Therefore, it is important to consider contextual elements when it comes to knowledge transfer. We present a brief description (explanation) of contextual elements at the start of Chapter 4.

## 3. Research method

This paper is primarily based on a literature study – specifically speaking, it is based on a narrative literature study / review.

Narrative literature review takes into consideration several studies of a particular theme and provides opportunities for the reviewer to gain knowledge on various views with regard to the theme. It also allows the reviewer to gain a holistic understanding of the studies by using existing theories and models and his / her experience (Campbell Collaboration, 2001; Kirkevoid, 1997).

Narrative literature review starts normally from one or more known sources of knowledge, and then based on the available knowledge and information from the previous search-results, further sources of knowledge are identified and relevant knowledge is obtained.

In the work related to this paper, search-terms such as "knowledge", "knowledge transfer", "knowledge sharing", "knowledge context", "tacit knowledge", "knowledge management", "experiential learning" were used to find relevant literature. Oria search engine (oria.no) and Google (including Google scholar) were applied to search for relevant literature. Oria is a common web portal for collected materials that are found in most of the Norwegian academic and research libraries.

Once the relevant literature had been selected in the first round, then the second round of selection (filtering) was carried out to identify the core literature that could help us to develop a coherent, logical presentation and discussion of the chosen topic. The filtering process included reading the selected literature to identify the core literature.

#### 4. Contextual elements

Knowledge can be considered as a system that includes, among other things, the contextual elements that are embedded with the *pure* knowledge itself – that is, a combination of knowledge as such and the contextual elements that are integrated into that knowledge (as such) . Thus, when we are to transfer knowledge, we cannot deal only with the *pure* knowledge elements. We also have to consider the suitability of the knowledge with regards to the situation. A particular solution that produced desired results successfully in a particular situation does not necessarily have to produce the same positive effect in another situation. Even, an unexpected negative result may emerge, since the situational factors play their intricate role in knowledge transfer. There is a connection between the *pure* knowledge elements and contextual elements in varying degrees. Both are to be considered as parts of a whole, as a system. Contextual elements can contribute to

- creating causal relationship between the elements of the system of knowledge and / or
- determining the meaning of causal relationship between the elements of the system of knowledge.

Certain types of knowledge are highly context oriented. When transferring such knowledge, contextual elements play a significant role in the transferring process and determine the usefulness of transferring knowledge. Bellini & Canonico (2008) say

"It is also important to recognize that the creation, diffusion and application of knowledge is situated and thus heavily influenced by the context of practice" (Bellini & Canonico, 2008, page 45).

Some of the contextual elements could be integrated into the knowledge while the knowledge was acquired. These elements might be included without the awareness of the individuals who acquire the knowledge; for example, through implicit assumptions and models. When a person tries to obtain context-rich knowledge from another person, then the knowledge must be examined and made sure that it is useful in a situation in which the knowledge is going to be transferred and applied. To examine the usefulness of the knowledge, the knowledge must be transformed. Both the knowledge-provider and knowledge-seeker take part in the transformation process.

How do the contextual elements influence knowledge acquisition? One way of looking at this issue is within the realm of sense making.

##### 4.1 Sense making at the start of acquiring knowledge

An individual may see a situation as complex and incomprehensible at the first sight when he/she attempts to acquire certain knowledge. In order to make an understanding of the situation – to make sense of the situation – the individual tends to extract cues from the situation. These cues

can then be used to form a clear picture of the situation. Extracting cues can also be seen as a filtering process that filters information, especially overwhelmed information in order to make a complex situation comprehensible.

Weick (1995) mentions two ways by which extracted cues are affected by context:

- Context influences in determining what is extracted as a cue.
- Context influences interpretation of the extracted cues.

There are social and cultural elements of context that can affect determining and interpreting extracted cues. Social influence can shape individuals' understandings. Weick says that though sense making sounds like an individual level of analysis, it is a social process (Weick, 1995). Social processes in which organizational members are involved can direct the members' focus on certain cues and affect sense making in their organizational settings. Viewing the process of learning from social construction perspective, Brown and Duguid (1991, page 47) say

"Learners can in one way or the other be seen to construct their understanding out of a wide range of materials that include ambient social and physical circumstances and histories and social relations of the people involved."

#### 4.2 Sense making during and after knowledge acquisition

When individuals acquire knowledge, then they are exposed to several outcomes and information. They experience or see their actions as well as outcomes of their actions. Their perception on these oncoming experiences can affect the knowledge that is created from the experiences, and become integrated with the knowledge.

Individuals may give different emphases on different components of their experiences. Their personal characteristics and external factors can lead them to make the different emphases. These emphases and the way of perceiving the experiences can create a version of the events (perhaps a kind of a personal history) that is related to the process of knowledge acquisition. When transfer of the knowledge takes place in a later period, the knowledge that is intended to be transferred can be susceptible to have certain amount of influence of individual version of the events (the history). March *et al.* (1996) say that people draw more information from their limited experience, by considering the unique incidents that they experience as detailed stories rather than single data points. In this regard, the people elaborate their experience by discovering more aspects of experience, more interpretations of experience and more preferences by which to evaluate experience – a sort of a process of making sense and adding context to the information.

Weick (2001) says

"If sense making is about nothing else, it is about the resourcefulness with which people elaborate tiny indicators into full-blown stories, typically in ways that selectively shore up an initial hunch."

This process can also be seen in connection with confirmation bias; selectively seeking / perceiving information to confirm ourselves (Robbins & Judge, 2008).

This elaboration (of experience / events) can be viewed as a supporting mechanism that creates/develops knowledge from a set of experiences. But, it is also to be noted that there are a number of pitfalls that are associated with interpretation of such experiences. Levitt and March (1996, page 512) say

"Certain properties of interpretation of experience stem from features of individual inference and judgement. [...] They (individual human beings) make systematic errors in recording the events of history and in making inferences from them. They overestimate the probability of events that actually occur and of events that are available to attention because of their recency and saliency. They are insensitive to sample size. They tend to overattribute events to the intentional actions of individuals. They use simple linear and

functional rules, associate causality with spatial and temporal nearness, and assume that big effects must have big causes."

The overattribution of events can also be seen as a result of confirmation bias (selectively seeking / perceiving information to confirm ourselves) and availability bias (too much focus on and rely on readily available information) (Robbins & Judge, 2008).

Another aspect that is related to history and experiences is the impact of the (current) context from which we refer the history and experiences. Here we focus on how current context affect referring experiences. When a person tries to transfer his/her knowledge to someone else, then he/she may look back and refer, at least roughly, experiences that are related to acquisition of the knowledge. This referring can *assimilate* some elements of the current situation and thus affect viewing and interpreting the past experiences; that is, the individual uses *NOW* as a basis for interpreting (making sense of) *THEN*. Weick (1995, page 26) says

"Because the attention is directed backward from a specific point in time (a specific here and now), whatever is occurring at the moment will influence what is discovered when people glance backward. [...] Whatever is now, at the present moment, under way will determine the meaning of whatever has just occurred."

Here it is interesting to note what Fischhoff (1975) and Pettigrew (1985) say. They say that frames applied to a history appear to have more influence than the history itself on determining what is learned. This is, in a way desirable, since these frames are constructed by, among other things, some elements that represent the current context. Hence, usage of these frames can contribute to the knowledge transformation process to a certain extent.

On the other hand, it can also distort the lessons to be learned; for example, it can be a dilemma whether to evaluate the earlier learning (or decisions that were involved in the earlier learning) based on the information that was available when the learning was occurred or on the information that we have five years later.

The description regarding *history* in the above discussion also suggests a form of knowledge transfer – transferring knowledge through storytelling, which is different from transferring mere facts. This reflects the notion of "knowledge-as-meaning" that we have seen earlier.

An important issue regarding knowledge transfer is to consider to what extent an organization can focus on exploiting knowledge that exist (knowledge transfer) contra exploring new knowledge. March (1991) discusses the possible hurdles that too much focus on knowledge exploitation in adaptive processes can create to knowledge exploration. Hence, having a proper balance between knowledge exploitation and knowledge exploration is important when the topic of knowledge transfer is addressed.

## 5. Concluding remark

Contextual elements that are associated with knowledge is important to be considered, when it comes to transferring knowledge and lessons learned to future projects. A particular solution can work well in a situation, but it does not necessarily produce the same desirable results in another situation, if it is applied without taking into account the characteristics of the new situation.

As we have seen earlier, knowledge is not just data and hard facts. It is also about creating meaning, sense making, practice, insights and tacit aspects. Giving adequate consideration on contextual issues is hence significant in transferring lessons learned from one context to another.

This paper aimed to address one of the fundamental issues of collecting existing knowledge / solutions that can be applied successfully in other projects / contexts. Contextual elements that

are associated/integrated with knowledge do not often taken into consideration adequately during knowledge transfer. Hence, this can lead to undesirable consequences; for example, unnecessary use of time and resources. We believe that this paper will increase the awareness of (and lead to finding appropriate ways to) dealing adequately with contextual elements in knowledge transferring processes. This paper will hopefully contribute to replicate knowledge / lessons learned effectively and to increase the application of energy efficient solutions in building renovation projects.

Further study can include exploring the possibilities of using the latest advancement in the digitalization technology – How solutions developed from the modern digitalization technology can support and enhance the process of dealing effectively with contextual elements in knowledge transferring processes.

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